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ABSTRACT

A conceptualization of statewide planning for postsecondary education is proposed in this document that builds on fundamental notions of objectives and decision. Perhaps its principal virtue is that it provides a basis for analyzing and relating both operational problems and organizational issues. Analysis of the problems and decisions that face postsecondary education planners leads to the formulation of lists of relevant information. These lists provide a basis for further detailed discussions of the problems and issues with state-level planners, which can lead ultimately to the design of state-level information systems. They also suggest the kinds of analytical projects that would be relevant to the needs of state-level planners and decisionmakers. (Author)

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National Center for Higher Education Management Systems at WICHE

STATEWIDE PLANNING FOR POSTSECONDARY EDUCATION: CONCEPTUALIZATION AND ANALYSIS OF RELEVANT INFORMATION

BY

PAUL WING, D. ENG.

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MARCH 1972

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ABSTRACT

A conceptualization of statewide planning for postsecondary education is proposed that builds on fundamental notions of objectives and decisions. Perhaps its principal virtue is that it provides a basis for analyzing and relating both operational problems and organizational issues. Analysis of the problems and decisions that face postsecondary education planners leads to the formulation of lists of relevant information. These lists provide a basis for further detailed discussions of the problems and issues with state-level planners, which can lead ultimately to the design of state-level information systems. They also suggest the kinds of analytical projects that would be relevant to the needs of state-level planners and decision makers.

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INTRODUCTION

As recently as a decade ago, statewide planning was the concern of only a few forward-looking analysts of higher education (see Glenny, 1959, and Moos and Rourke, 1959). However, the last few years have seen a tremendous growth in interest in the subject and, equally important, the authorization and establishment of state-level coordinating and governing agencies in nearly all states. (As of October 1971 only three states [Delaware, Vermont and Nebraska] had no legal state agency. Of the other states, 25 have coordinating boards, and 22 have consolidated governing boards. [See Education Commission of the States, 1971.]) These new agencies have not been established under the best of conditions. They have typically been thrust into the middle of a complex decision-making framework that has existed and evolved for decades, and the first order of business is often jockeying with both institutions and other state and national groups to determine where jurisdictional boundaries lie.

Building on a discussion of objectives and decisions, this paper presents a perspective on statewide planning that is both theoretically consistent and operationally useful. State-level planning and decision-making problems and issues are analyzed to determine the kinds of information that are relevant to their solution and resolution. And these information "requirements" in turn suggest directions for future efforts relating to the development of both communication aids and analytical planning tools.

Although it does suggest a particular approach to planning for postsecondary education, this paper does not make recommendations concerning specific policy issues, courses of action, and organizational structures. These are matters that must be resolved by the individuals and organizations that are responsible for these decisions.

General Remarks

Since states currently allocate almost 10 percent of their operating budgets for higher education programs, and that amount accounts for more than 30 percent of the total expenditures for higher education in the country (derived from U. S. Bureau of Census, 1970, Table 17, and National Center for Educational Statistics, 1969, Table 3), their claim to a role in the planning process seems well justified. However, the newness of the coordinating and governing agencies and the complexity of the problems have hindered the development of effective coordination at the state level. Palola (1970) concluded that despite some contributions to educational autonomy and performance of colleges and universities, these agencies failed in several important respects to provide a basis for coordinated efforts among the institutions in the Sixties. Part of this failure is certainly due to a very natural defensiveness among academicians and institutional planners who have no real assurances about the extent of "the takeover." But until general agreement is reached on jurisdictional boundaries, "the individual self interest of colleges and universities [will prevent] full collaboration in statewide planning and coordination." (Henderson, 1966, p. 507.)

It is not our intention to propose that coordinating agencies or governing boards are, or ought to be, the only or even the primary planning and decision-making group at the state level. Other constituents are involved in and concerned about postsecondary education, and their roles in planning and decision-making processes should be considered carefully. The extent to which each of them should be involved is not entirely clear, but since any plans that are formulated will have an impact--either direct or indirect--on all of them, planners should be aware of their existence and general role. Certainly the list should include students, faculty, institutional administrators and governing boards, statewide planners and coordinators, state governors' offices and legislatures, the federal government, state and federal courts, the general public, alumni and other benefactors, business and industry, private foundations, and special interest groups.

In the discussion that follows a distinction is drawn between state government and state agencies. State government refers to elected officials, particularly governors and legislators. State agency refers to any of the permanent agencies involved in state-level planning and decision making, including coordinating councils, governing boards, budget offices, and legislative analysts. The distinction is somewhat arbitrary but does seem reasonable in light of the roles generally assumed by the two groups. It will be the responsibility of the reader to decide which specific agency in his state most closely corresponds to the problems or decisions being discussed.

Whether there can be an agreement among the major constituents on an appropriate way to plan for higher education is not clear at this time. A great deal is to be gained by all groups by the continued prosperity of higher education, but there are differences of opinion about the best course for the future, particularly with regard to program priorities, activity levels, and governance patterns. Most analysts seem to agree that more state-level involvement in appropriate areas of concern will lead to both more efficient operations in postsecondary education and more effective programs.

The place of private institutions in the context of public planning is often a problem. To exclude them would clearly void any claim to comprehensiveness that a planning system might have, and to include them would raise special questions about automony, since private institutions typically use much less state revenue for support of their regular programs than do public institutions. The general suggestions on this matter by Glenny, et al. (1971, p. 124) seem particularly appropriate. Specifically, "If state aid to the private sector is minimal, the relationship [between the coordinating board and the nonpublic institutions should be] quite casual. If the state is carrying heavy financial commitments to nonpublic universities and colleges, we suggest a more closely linked relationship." Glenny recommends that nonpublic institutions participate in the exchange of at least such basic information as enrollment projections and planned new programs as well as responses to HEGIS questionnaires.

Without this minimal participation by all private institutions, planning could hardly qualify as complete or comprehensive.

A FRAMEWORK FOR ANALYSIS

Objectives and Decisions in Postsecondary Education

At the highest level any governmental agency may have only one objective: to improve the welfare of its constituents, both collectively and individually. However, the complexity of systems such as postsecondary education forces the establishment of hierarchies of objectives and decisions as a means of maintaining control over the system. (March and Simon [1958] argue that the cognitive limits on human rationality force man to establish these hierarchies. Since he can attend to only a limited number of things at one time, he must either adopt a simpler model of reality or delegate functions and responsibilities to others.) And needless to say, the formal organization of higher education also takes on a hierarchical structure.

In developing the theoretical framework for their study of the sociology of educational planning, Palola, Lehmann, and Blischke (1970, pp. 16-19) define four broad categories of goals for education: social/cultural, economic, political, and humanistic/psychological. (See also Lawrence, 1970.) They also classify goals according to three organizational units: the state, the segment (referring to type of institution), and the institution. Though not central to the analysis the authors have performed, these goal structures do suggest an approach to the analysis of planning for postsecondary education that seems quite promising. A set of specific goals and objectives should be established as a benchmark against which the results of projects can be

measured as analysis progresses. This paper will follow their lead by focusing on what Selznick (1957) has called "critical decisions"; that is, those decisions that have long-range, fundamental implications for the development of postsecondary education.

As a basis for discussion, a tentative five-level hierarchy of objectives for postsecondary education is proposed. Beginning with the first level, which is concerned with overall priorities (e.g., education vs. welfare), successive levels become more detailed in their concern for education and the educational process. Table 1 specifies the five levels in some detail. Within this framework, it is possible to suggest specific objectives that correspond to the different levels, as in Table 2. To reflect the general correspondence between objectives and decisions at each of the five levels, specific decisions that fit into this general framework are included in Table 2. (Although it is not reasonable to classify decisions according to the five-level hierarchy of Table 1 [a classification scheme based on issues would be more appropriate], there seems to be sufficient correspondence between objectives and decisions to justify this juxtaposition.)

This structure is certainly not the last word on the subject. It is intended primarily to define a perspective that can be used in the exploration of the planning process in postsecondary education. From it can be developed an orderly discussion of the problems of defining planning and decision-making responsibilities for different constituents and the identification of projects that can be pursued to improve state-level planning processes.

TABLE 1

HIERARCHY OF OBJECTIVES OF POSTSECONDARY EDUCATION

Level	General Description
Level 1	Aggregate objectives and decisions related primarily to setting overall priorities.
Level 2	Objectives and decisions focusing primarily on interactions between educational programs and society.
Level 3	Objectives and decisions focusing primarily on program content and structure in postsecondary education.
Level 4	Objectives and decisions related primarily to internal operations of educational institutions.
Level 5	Individuals' objectives and decisions as they relate to specific educational institutions and programs.

TABLE 2

OBJECTIVES AND DECISIONS IN POSTSECONDARY EDUCATION

Objectives	Decision
LEVEL 1	
- Opportunities for self-expression and self-improvement - Enhancement of quality of life through education - Equal access to higher education - Manpower and skill development - Continued flow of new ideas and tools into society	- Aggregate educational program sizes and mixes (instruction, research, public service) - Expansion or contraction rates - Financing - Access policies and incentives - Balance between elementary, secondary, and postsecondary education
LEVEL 2	
- Opportunities for residents to obtain higher education in programs and institutional settings appropriate to personal needs - Congruency between educational courses, programs and curricula, and needs of students and society - Better environment for other desirable activities - More effective use of resources - Equitable financing arrangements - Balance between supply and demand for academic and professional manpower - Research and public service contributions to solutions of social problems	- Educational program sizes and mixes - Expansion or contraction rates of institutions and programs - New program development - Admissions and access policies - Institutional location - New construction, capital budgets - Financing, tuition rates - Organizational structures and roles, mission and scope - Enrollment ceilings
LEVEL 3	
- Diversity in program offerings and institutional arrangements - Improved quality of education - Research and public service contributions to solutions of social problems - Admission of all qualified and interested students into appropriate programs	- Degree requirements - Admissions policies - Departmental size - Teaching technology - New programs - Curricular and program content - Relation of public service and research programs to educational functions

TABLE 2 (Continued)

Objectives	Decision
- Opportunity for all graduates to work and contribute to society - Avoidance of unnecessary, unproductive, or duplicative programs - Recognition of and adaption to new societal demands - Flexibility, stability, and balance between education, research, and public service programs - Academic and procedural requirements for degrees that insure respect for graduates without being burdensome	- Facilities design
LEVEL 4	
- Survival of institutions and programs - Social and professional behavior conducive to campus activities - Flexibility and stability in staffing - Effective instructional procedures and technologies - Palatable procedures for terminating unwanted programs - Efficient resource utilization	- Evaluation of students - Departmental size - Scheduling of classes - Promotions of faculty and staff, tenure - Room assignment - Admissions - Faculty workload and responsibilities - Financing - Salary levels for faculty and staff - Facilities layout
LEVEL 5	
- Stability of jobs, job descriptions, and terms of employment - Adequate remuneration, both monetary and psychological - Stimulating environment for study and/or work	- Application - Matriculation - Employment

TABLE 3

PATTERNS OF RESPONSIBILITY FOR SELECTED DECISIONS IN HIGHER EDUCATION (AS OF SPRING 1971)

Planning or Decision-Making Function	Agency or Organization														
	Institutional Governing Board				State Coordinating Agency			State Governing Board				Other Agency		Legislature
	IA	RS	RL	FA	R	RL	FA	IA	R	RL	FA	RL	FA	FA
Institutional Long-Range Plan	20	9	1	9	8	11	5	1	2	2	17	0	1	7
New Instructional Programs	22	15	0	9	5	5	16	0	1	0	19	0	0	1
Mission & Scope of Institutions	19	14	3	4	5	16	8	2	0	5	18	0	0	12
Capital Budget Requests	20	13	9	2	7	18	3	5	1	11	8	8	0	29
Operating Budget Requests	20	13	13	1	9	18	1	4	0	12	7	6	0	30
Building Purposes														
a. Overall design	16	10	1	12	7	2	2	4	0	5	14	3	11	1
b. Design features	16	10	1	11	7	3	4	3	1	4	13	3	10	1
c. Architect selection	15	5	1	16	4	0	0	4	0	2	13	2	11	1
d. Contract letting	14	6	0	14	4	0	0	3	0	3	11	3	13	1
Student Enrollments & Tuition														
a. Enrollment Ceilings	10	7	2	14	7	9	4	2	0	2	14	1	0	7
b. Tuition rates	6	3	3	14	11	6	5	1	0	3	17	1	0	6
Faculty Loads and Tenure														
a. Loads	7	2	2	22	8	1	0	0	1	2	13	0	2	1
b. Tenure	6	1	1	22	2	0	0	0	0	1	17	0	1	0

Notes: IA = Initial Approval; RS = Recommends to State Agency; RL = Recommends to Legislature and Governor; FA = Final Approval or Disapproval; R = Reviews. Based on responses from 48 states, 28 with coordinating agencies and 20 with governing boards.

Note that agencies and organizations usually have more than one role in the decision-making process. Thus the sum across each row is always greater than 42, the sample of states in the survey. Note also that final authority was apparently not identified for all states in this survey; thus the sum of final authorities is usually less than 42.

Source: Higher Education in the States, Vol. 2, No. 5, June-July, 1971, 73-88.

Decision Making in Postsecondary Education

In order to discuss statewide planning for postsecondary education in an orderly fashion, it is necessary to delimit, at least tentatively, the types of decisions made by state agencies and other constituents. Any number of specific classifications of decision-making responsibilities would undoubtedly be reasonable, and to specify just one, even for the purposes of discussion, is bound to raise the defenses of some individuals. But without a concrete suggestion, it would be difficult to extend this discussion into such practical areas as the identification of projects that can aid statewide planning efforts.

Perhaps the best place to start is with the current distribution of decision-making responsibilities in higher education. Table 3 outlines current patterns for eight major classes of decisions as reported by the Education Commission of the States. Although the figures indicate that governing boards have final authority more often than do state coordinating agencies, they show very little uniformity across the states. On budget matters state legislatures and/or governing boards have final authority in most states, while on matters related to faculty, students, and buildings, institutions or state governing boards generally have the final say. However, in all eight categories, each type of agency gets involved in the decision making in at least a few states.

Unfortunately, this leaves us with a very weak foundation for any discussion of the distribution of decision-making responsibilities in higher education. It emphasizes more the lack of uniformity that exists than the sort of general agreement that should exist with regard to planning and decision-making principles.

Figures 1a and 1b carry the previous notions about hierarchies of objectives and decisions directly into this discussion of decision-making responsibilities. The figures are hypothetical examples of two possible distributions of interest and responsibility that might exist in particular states. As suggested above, precise specification of the responsibilities in a particular state is a matter for the agencies and institutions in the state to resolve. The general ranges of interest defined by the curves in the figures reflect the variety that exists in organizational arrangements and responsibilities. These representations indicate not only the major interests of the different groups but also the ranges and overlaps in interest. It is important to note that the location and shape of the curves may depend on the particular issues and time frames, as well as the states, under consideration.

Although any specific allocation of decision-making responsibilities might be hard to support, general allocations such as those suggested in Figures 1a and 1b can be supported using a two-pronged argument. First, the location of an individual in the overall organization may preclude his making

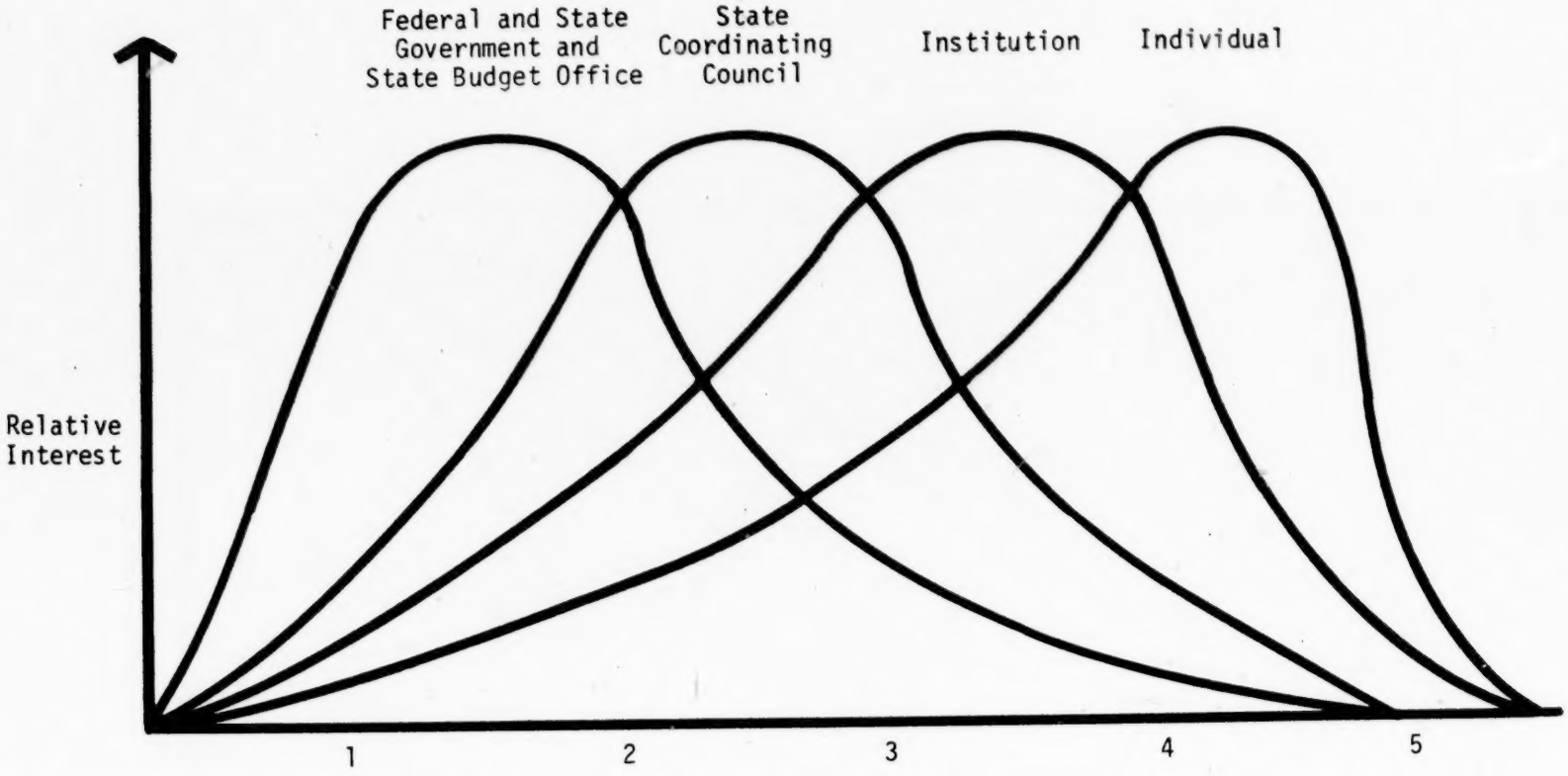

FIGURE 1a. Ranges of Interest for Major Classes of Postsecondary Education Planners and Decision Makers in a Hypothetical State Having a Coordinating Council

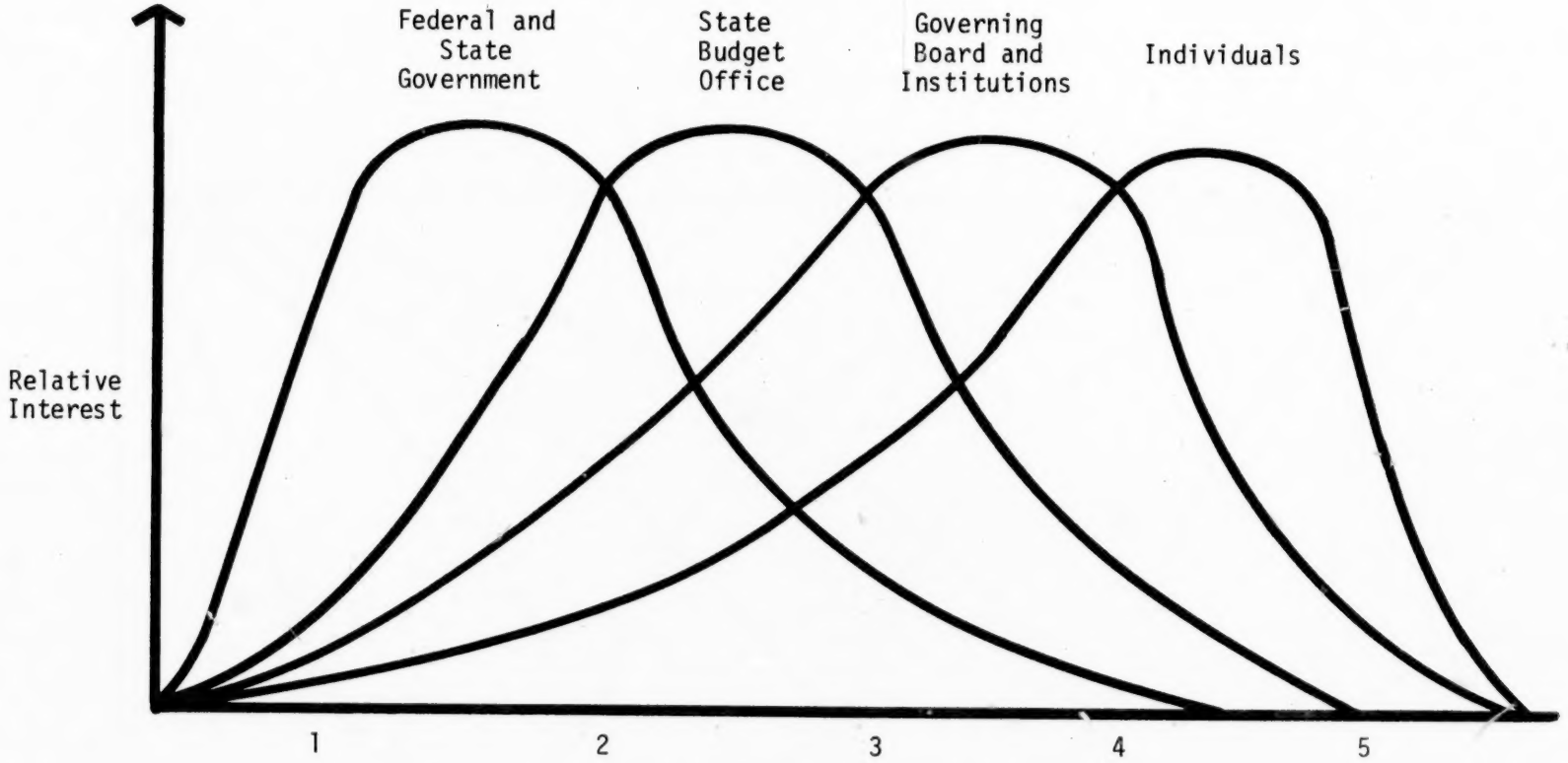

FIGURE 1b. Ranges of Interest for Major Classes of Postsecondary Education Planners and Decision Makers in a Hypothetical State Having a Governing Board

certain kinds of decisions. For example, individual institutions do not have access to sufficient information concerning other institutions to make interinstitutional resource allocation decisions. On the other hand, a system that is too highly centralized may be very inefficient (March and Simon, 1958). This is particularly true in a system as complex as higher education in the U. S. today. Thus, in order for postsecondary education to function effectively and efficiently, responsibility for decision making must be delegated from the top down until sufficient organizational levels exist for effective operation. In fact, one could argue that the emergence of state-level planning agencies is an example of precisely this phenomenon. State governments have been unable to cope with the growth and complexity of higher education and have been forced to establish new agencies to handle the information and decision-making overloads.

In many instances practical, political, and operational problems override these relatively abstract considerations. The point remains, however, that questions of locus of decision-making responsibility can be discussed in a rational framework and that without such discussions states and institutions may find themselves making important decisions using inadequate or inefficient organizational structures and information systems.

DECISIONS AND INFORMATION RELEVANT TO STATE AGENCIES

Up to this point, the discussion has been rather abstract and theoretical. We have argued that state agencies, because of their location in the overall organizational framework and the nature of the decisions that must be made, are concerned primarily with objectives and decisions at the second and third levels of the five-level hierarchy that has been established. Despite obvious differences in the specific responsibilities of particular agencies, it is of interest to examine these Level 2 and 3 decisions more carefully, since these are important responsibilities of many state agencies (as can be seen in Table 3), and careful analysis of them provides important insights into the needs for both information and planning tools.

Table 4 enumerates important Level 2 and 3 problem areas and issues. This list is somewhat different from the one in Table 2 to facilitate the identification of relevant information and also to conform more closely to the list in Table 3. Given this set of problem areas, one can develop a comprehensive description of information "requirements" at the state level. Not all agencies will need all of the information or the same information, but knowing the decisions that it must handle, a state agency can determine its own specific needs for information, tools, and techniques.

Each of the problems or issues enumerated in Table 4 has associated with it a list of information items relevant to its analysis and/or solution. These may be factual data on inputs, outputs, or processes; or they may be

TABLE 4

SECOND- AND THIRD-LEVEL ISSUES AND PROBLEM AREAS

Governance

- Specification of state and institutional missions (5a)*
- Organizational and coordinative structures (5b)

Student access

- Admission policies (5c)
- Incentives for student enrollment (5d)

Programmatic decisions

- Specification of institutional roles
  - Program mix and content (5e)
  - Relation of research and public service to instruction (5f)
  - Program size and decisions to add, expand, contract, or eliminate a program (5g)
- Establish or close a campus (5h)

Resource Allocation

- Operating budgets (5i)
- Capital budgets: build, add to, remodel, or raze a building (5j)

Faculty and staff

- Salary schedules (5k)
- Employment, promotion, retirement, and tenure policies (5l)
- Workload policies (5m)

Growth patterns

- Enrollment ceilings, growth rates (5n)

Financing

- Sources of funds for different programs and projects (5o)
- Tuition, scholarships, and loan policies (5p)

Certification

- Student competence (5q)

*Figures in parentheses identify table in which information relevant to the issue or problem is itemized.

"environmental/political" insights that are required to understand the particular problem and the context in which it has arisen.

Tables 5a to 5q represent a first step in the task of identifying these items of relevant information. The tables probably have insufficient detail to be operationally useful, at least in their present form, but they should serve as a basis for discussing information requirements with different state-level planners and decision makers in the second phase of this research project. By including representatives of state legislatures, state budget and finance offices, state coordinating boards, and state governing boards in the discussions, it should be possible to develop comprehensive lists of information "requirements" that can serve as the basis for a standardized system of defining data elements for state-wide planning purposes.

The use made of the resulting "dictionary" would depend on the needs of the specific users. By comparing the lists of relevant information in Tables 5a to 5q with the information available in the data base maintained by the agency, one should be able to determine quite specifically the additions and modifications that would be required to handle that agency's particular decisions effectively. It could also be used as an aid in the definition and selection of analytical projects that could be undertaken either within or outside of the programs of the National Center for Higher Education Management Systems (NCHEMS). (Possible projects are discussed briefly in Wing, 1972.)

TABLE 5a

INFORMATION RELEVANT TO THE PROBLEM OF
SPECIFYING STATE AND INSTITUTIONAL MISSIONS

1. Societal goals and objectives with respect to such indicators as literacy, health levels, standard of living, equality of opportunity (quantified, if possible)

   a. Desired levels of attainment
   b. Current levels of attainment

   } Expressed in terms of outcome indicators (degrees, access, manpower, salaries, etc). See Wallhaus and Micek, 1971.

2. Impact of existing institutional programs relative to objectives

   a. Strengths and weaknesses of particular programs and kinds of institutions

      (1) Are all sectors served adequately?

         (a) Are benefits dispersed geographically?
         (b) Are different socioeconomic groups served?

      (2) Cost data

         (a) Sources of funds
         (b) Cost per unit of output

   b. Side benefits

      (1) Local economic impact

         (a) Effect on tax rates
         (b) Effect on business
         (c) Effect on real estate and land usage

      (2) Prestige

3. Past effectiveness of existing programs

   a. What have they accomplished in the past?
   b. What have they not accomplished?

   } Expressed in terms of costs relative to outcomes when possible

4. Alternative programs for attaining the objectives (nontraditional educational systems, programs outside education, etc.)

   a. Cost-effectiveness information
   b. Impact on particular constituents
   c. Probable sources of funds

5. Institutional aspirations

TABLE 5b

INFORMATION RELEVANT TO THE PROBLEM OF
DESIGNING ORGANIZATIONAL AND COORDINATIVE STRUCTURES

1. Sectors and groups involved in planning and decision making

    a. Information requirements of different individuals and offices
    b. Formal communication patterns currently in existence
    c. Sectors represented

        (1) By the formal system
        (2) Informal representation patterns
        (3) Unrepresented groups

2. Effectiveness of different organizational structures

    a. Impact on goal attainment
    b. Impact on planning for the future
    c. Logic of the structures

        (1) Reasonable locations of decision-making centers
        (2) Effective information flows

    d. Impact on efficiency

        (1) Duplication of efforts and costs
        (2) Conflict and disagreement

    e. Impact on personnel relations

        (1) Incentives for involvement
        (2) Managerial initiative and individual creativity

    f. Relation to informal organizational structures

        (1) Political viability

3. Costs of different organizational structures

    a. Staff and facilities required (in entire system) under different options
    b. Information systems

        (1) Gathering, reviewing, and editing
        (2) Processing and transmitting
        (3) Storing

TABLE 5c

INFORMATION RELEVANT TO THE PROBLEM
OF ESTABLISHING ADMISSIONS POLICIES*

1. Statewide objectives relative to opportunities for postsecondary education (by socioeconomic, geographic, and ability factors)

   a. Who is to be given an opportunity? When? Campus or program of choice?
   b. Is special consideration to be given to certain groups?

2. Available openings in current programs and institutions

   a. Openings for new and transfer students - current and expected
   b. Dropout, transfer, and "vacation" rates
   c. Current and historical enrollment patterns - groups served

3. The potential pool of applicants for different programs and institutions (by socioeconomic, geographic, and ability factors)

   a. Aptitude and achievement levels - averages and distributions
   b. Numbers of potential applicants in different centile groups

4. Expected size of actual pool of applicants

   a. Socioeconomic factors

      (1) Student aid available
      (2) Family background and financial status
      (3) Race, sex, etc.

   b. Geographic factors, particularly location of programs and institutions relative to location of applicants
   c. Ability levels (high school rank, entrance exam scores, etc.)
   d. Age groups

5. Expected effect on number of applicants and admissions under alternative admissions policies, program locations, cost structures

   a. Financial incentives (tuition, scholarships, loans, etc.)
   b. Entrance requirements (high school rank, entrance exam scores, prerequisites)
   c. Statewide student flow between institutions
   d. Impact of different locations for programs, offerings, and times

6. Information on transfer of credit

*See Tables 5d and 5p.

TABLE 5d

INFORMATION RELEVANT TO THE PROBLEM OF
PROVIDING INCENTIVES FOR STUDENT ENROLLMENT

1. Groups that appear to need incentives, identification of target groups

    a. Socioeconomic subpopulations
    b. Geographic subpopulations

2. Factors related to applications and enrollments of different subpopulations

    a. Proximity to program or institution
    b. Costs to students

        (1) Out-of-pocket costs
        (2) Student aid available
        (3) Foregone income

    c. Employment opportunities

        (1) Work-study
        (2) Summer jobs
        (3) Part-time employment

    d. Future job market prospects by disicpline and department
    e. Other employment opportunities (military service, jobs available to high school graduates)
    f. Indenture or pay-back features of aid plans
    g. Success rates (percentage of graduates, percentage of dropouts, etc.) by program and institution
    h. Opportunities and risks presented by other postsecondary programs

3. Costs of different incentive plans

    a. Sources of funds
    b. Cash flows over time
    c. Mix of institutions involved (public/private)

4. Impact of different financing plans

    a. Participation rates expected
    b. Pay-back period or break-even point

        (1) Individual Students
        (2) Institutions

TABLE 5e

INFORMATION RELEVANT TO THE PROBLEM OF
ESTABLISHING POLICIES ON PROGRAM MIX AND CONTENT*

1. Demand for graduates of different programs by various segments of the economy

    a. Industrial and business firms
    b. Academic institutions
    c. Governmental agencies
    d. Expectations of potential employers

        (1) Specific competencies and skills
        (2) General aptitudes

2. Demand for programs by students (see Table 5d)

    a. Historical demand (number of applicants and enrollees)
    b. Projected demand based on surveys, expected future job prospects, etc.
    c. Student expectations

3. Resources available for different programs - current and expected

    a. Faculty

        (1) Number by program and department
        (2) New positions
        (3) Faculty standards (achievement levels, work loads, etc.)

    b. Facilities and equipment

4. Costs of running programs and departments

    a. Cost of resources
    b. Scale economies
    c. Capacity of key production factors

        (1) Students per faculty member
        (2) Students per unit of physical facilities and equipment
        (3) Substitution ratios (e.g., rates at which equipment can be substituted for faculty)

5. Departmental interactions

    a. Service relationships (i.e., extent to which departments draw on each other - induced course load matrix)
    b. Interdisciplinary programs

TABLE 5e - Continued

6. Programs at other institutions - for comparisons

    a. Structure (i.e., expository, clincial, or experimental)
    b. Content
    c. Acceptance

        (1) By students
        (2) By employers

7. Subject matter

    a. Exposure required to establish useful working understanding
    b. Logical and cohesive subunits of knowledge

*See Table 5g

TABLE 5f

INFORMATION RELEVANT TO THE PROBLEM OF ESTABLISHING POLICIES ON THE RELATIONS AMONG RESEARCH, PUBLIC SERVICE, AND INSTRUCTION

1. Impact of research and public service programs on instruction

    a. Costs

        (1) Sharing of faculty - joint appointments
        (2) Overhead

    b. Program offerings

        (1) Additional enrichment due to joint appointments
        (2) Special research and public service "course" offerings
        (3) Joint products

2. Role of research and public service programs in local and state affairs

    a. Economic impact

        (1) Relation to business and industry
        (2) Attraction of new enterprise

    b. Impact on prestige, lifestyle, and cultural environment

3. Faculty and staff desires

    a. Need to establish and maintain leadership or expertise in field of study

        (1) Requirements for publishing research results
        (2) Requirements for publishing or exhibiting scholarly or artistic work
        (3) Requirements for developing and applying innovative programs and processes in public service programs

    b. Personal preferences

TABLE 5g

INFORMATION RELEVANT TO PROGRAM SIZE AND DECISIONS TO ADD, EXPAND, CONTRACT, OR ELIMINATE A PROGRAM*

1. Description of program

   a. Role of graduates in society
   b. Types and numbers of degrees to be awarded
   c. Expected outcomes and indicators (See Wallhaus and Micek, 1971)
   d. Features not provided by other programs
   e. Size of program

      (1) Enrollment and degrees planned
      (2) Maximum size
      (3) Minimum feasible size

   f. Expected benefits

      (1) For individual students
      (2) For society

   g. Relation to other programs

2. Program costs

   a. Resources required; facilities and faculty
   b. Cost of the resources, total and per outcome indicators (degrees, credit hours, etc.)
   c. Start-up/shut-down costs and expected annual costs in the future
   d. Scale economies
   e. Cost per student by level and program

3. Costs of alternative programs - different ways of achieving same end

4. Current and long-range labor market prospects relative to program

   a. Current supply of manpower - state and national
   b. Current production of degree holders - state and national
   c. Plans of other programs and institutions
   d. Current needs for manpower - state and national
   e. Likely migration patterns - interstate and intrastate

5. Demand for the program by prospective students

   a. Projected student enrollment
   b. Alternative programs in which they would enroll if new programs were not available or if a program were discontinued

6. Demand for educated citizenry

   a. General education
   b. Specific job training and skills

TABLE 5g - Continued

7. Institutional aspirations

   a. Academic master plans, institutional plans
   b. Proposals and desires relative to the program under consideration
   c. Interrelations among programs (mutually supporting programs)

8. Budget request and appropriations - initial and projected

   a. Operating
   b. Capital

9. Total resources available for new programs

10. Possible short-term constraints

   a. Tenured faculty
   b. Short supply of needed faculty and staff in labor market
   c. Facilities, equipment, etc.
   d. Lead times and delays for construction
   e. Program continuity - students currently enrolled

*See also Table 5e.

TABLE 5h

INFORMATION RELEVANT TO THE DECISION
TO ESTABLISH OR CLOSE A CAMPUS

1. Description of campus

   a. Initial and ultimate size; growth pattern
   b. Programs to be included and phasing over time
   c. Special emphases and objectives
   d. Role in overall state plan
   e. Relation to "feeder" program (high schools, junior colleges, senior institutions, public and private schools, etc.)

2. Need for the campus

   a. Conditions at existing campuses (e.g., crowding)
   b. Inadequacies of existing programs
   c. Student needs and demands - current and expected
   d. Enrollment ceilings, projected campus growth rates

3. Costs - initial and projected

   a. Capital
   b. Operating
   c. Land acquisition
   d. Inflationary effects

4. Alternatives: costs, disadvantages and advantages

   a. Expand existing campuses
   b. No expansion or contraction

5. Location of campus

   a. Location relative to existing schools and campuses
   b. Population centers - current and future

      (1) Demographic data
      (2) Current redirection patterns
      (3) Migration of students

   c. Transportation links
   d. Potential cost differences

      (1) Construction site features and wage differentials
      (2) Cost-of-living impact on future operations

   e. Labor Market

TABLE 5h - Continued

6. Other competing projects

7. Financing

   a. Sources of revenue
   b. Impact on taxes
   c. Bonds - bond market

8. Impact on other institutions

TABLE 5i

INFORMATION RELEVANT TO THE CONSTRUCTION
AND REVIEW OF AN OPERATING BUDGET

1. Programs covered by the budget
   a. Instructional
   b. Research
   c. Public service
   d. Support and auxiliary
2. Description of programs and institutions
   a. Resources measures
      (1) Personnel
      (2) Facility
      (3) Major equipment
   b. Activity measures
      (1) Student contact hours
      (2) Services provided
   c. Target and beneficiary groups
   d. Financial measures
      (1) Revenues - source and means of generation
      (2) Expenditures
   e. Outcome measures
      (1) Degrees
      (2) Program completions
   f. Supporters
3. Costs - historical and projected
   a. Cost by program - by level of student, etc.
   b. Cost by discipline or organizational unit
   c. Cost by object
   d. Other factors - scale economies, cost trends, start-up adjustments, geographic differences, etc.
4. Priorities among programs - state and institutional
   a. Alternative ways of achieving objectives - expansion, new programs, nontraditional programs, different program mix, etc.
      (1) Costs
      (2) Effectiveness

TABLE 5i - Continued

b. Commitments - implied and explicit

(1) Tenured faculty
(2) Buildings
(3) Etc.

5. Performance relative to program objectives and budget in previous years

a. Benefits - state, local, national
b. Problems and difficulties - overproduction, etc.
c. Cost per outcome - trends

6. Total amount available for budgeting

a. For entire state
b. For postsecondary education

TABLE 5j

INFORMATION RELEVANT TO THE DECISION
TO BUILD, ADD TO, OR RAZE A BUILDING

1. Description of the building

   a. Number, size, and capacity of rooms by type
   b. Percentage of assignable space
   c. Special features (special labs, computer facilities, etc.)
   d. Architectural specifications
   e. Functional and structural adequacy

2. Need for the faciliities

   a. Current inventory of space on campus by type
   b. Current space utilization rates on campus
   c. Current and projected shortage or surplus of space

3. Impact of the proposal

   a. On academic environment

      (1) Types of programs and projects supported
      (2) Interactions among programs and departments

   b. On physical environment

      (1) Projected space shortage or surplus after completion
      (2) Physical crowding and open space
      (3) Parking
      (4) Utilities and maintenance
      (5) Support facilities (libraries, computer centers, etc.)
      (6) Projected utilization rates

4. Cost of the project

   a. Capital
   b. Annual operating costs or savings projected by year

5. Alternatives

   a. Cost differentials - present value
   b. Disadvantages and advantages

6. Relation to other capital projects

TABLE 5j - Continued

7. Institution, college, and departmental aspirations

    a. Priorities as outlined in academic master plans

8. Financing arrangements

    a. Sources of revenue
    b. Impact on taxes
    c. Bonds - bond market

TABLE 5k

INFORMATION RELEVANT TO THE PROBLEM OF
ESTABLISHING SALARY SCHEDULES FOR FACULTY AND STAFF

1. Current salaries at postsecondary education institutions

    a. By field of study, position, and experience
    b. Average salaries, salary distributions
    c. Comparisons with:

        (1) Geographically comparable institutions
        (2) Programmatically comparable institutions

    d. Cost-of-living factors

2. Salaries in other areas competing for faculty and staff - current and short-term projections

    a. Industry and business
    b. Consulting firms
    c. Government

3. Faculty and staff activities and contributions to programs

    a. Amount of time spent on different activities (See Romney, 1971)

        (1) Teaching activities
        (2) General faculty service activities
        (3) Administrative activities
        (4) Committee activities
        (5) Research, scholarship, and creative work project activities
        (6) Extrainstitutional service activities

    b. Percentage of time spent on different activities
    c. Relationships between faculty/staff assignments, activities, and stated institutional objectives

4. Faculty and staff migration patterns among institutions - net and gross, by field of study

    a. Among educational institutions
    b. Between educational and other types of agencies and organizations

5. Market prospects for new faculty and staff - level of competition

    a. Future Ph.D. graduates
    b. Recruits from other institutions, and organizations

TABLE 51

INFORMATION RELEVANT TO THE PROBLEM OF ESTABLISHING POLICIES ON EMPLOYMENT, PROMOTION, RETIREMENT, AND TENURE*

1. Current and projected mix of faculty (lecturer, assistant professor, associate professor, professor)

    a. Age distributions
    b. Expected retirement and promotion patterns
    c. Faculty flow

2. Desirable and minimum qualifications for faculty and staff positions

    a. Years of experience and age
    b. Specific skills and knowledge

        (1) Academic subject content
        (2) Contacts and influence within and outside of the institution
        (3) Technical expertise
        (4) Historical productivity measures (publications, employment history, etc.)

    c. Job context

        (1) Type of work expected
        (2) Present staff capabilities and interests

3. Competition for faculty and staff from

    a. Other academic institutions
    b. Business, industry, etc.

4. Impact of alternative retirement and promotion patterns on

    a. Mix of faculty and staff
    b. Costs

5. Costs of alternative retirement plans

    a. Cash flow requirements over time
    b. Reserve requirements ($)
    c. Administrative costs
    d. Risks involved
    e. Employee contributions required

6. Relationships among promotion, tenure, and faculty performance

7. Institutional philosophy - stable faculty vs. "training ground"

*See also Table 5k.

TABLE 5m

INFORMATION RELEVANT TO THE PROBLEM OF
ESTABLISHING WORK-LOAD POLICIES*

1. Services provided by faculty

   a. Concepts and skills transmitted to students
   b. Contributions to general knowledge and specific knowledge in field of study

2. Current work-load measures

   a. Faculty contact hours, faculty credit hours

      (1) Classroom
      (2) Laboratory
      (3) Individual contact
      (4) Preparation

   b. Student contact hours, student credit hours

   c. Research effort

      (1) Clock hours
      (2) Publications, papers, etc.
      (3) Students supported
      (4) Contract awards - $ to the institutions

   d. Public service effort

      (1) Clock hours
      (2) Publications, papers
      (3) Students supported or educated

         (a) As active participants
         (b) As observers

      (4) Value of services to community
      (5) Impact on institutional revenues

3. Work loads in comparable positions in other institutions and agencies

4. Compensation of individuals relative to work assignments in comparable institutions and programs

5. Relevance of work-load patterns to institutional and state objectives

*See Romney, 1971.

TABLE 5n

INFORMATION RELEVANT TO THE PROBLEM OF ESTABLISHING ENROLLMENT CEILINGS AND LIMITS ON GROWTH RATES*

1. Current enrollments

   a. Translated into facilities and staff requirements
   b. Impact on community and support services
   c. Translated into budgetary requirements

2. Number of individuals expected to be desiring postsecondary education in the future - by field of study

   a. Translated into facilities and staff requirements over time
   b. Impact on community and support services over time

3. Patterns of utilization of facilities and staff

   a. Excess or shortages of facilities
   b. Alternative use patterns (night, weekend, reorganization of academic periods, etc.)

4. Capacity of institutions to accommodate growth

   a. Resources available for expansion

      (1) Land
      (2) Facilities and equipment
      (3) Faculty and staff

   b. Time factors (start-up delays)
   c. Scale factors (economies of scale, critical mass, diminishing returns, etc.)
   d. Interrelations among programs

      (1) Joint program needs
      (2) Substitutability of production factors

5. Capacity of surrounding community to accommodate growth

   a. Lead times required to expand important facilities and services
   b. Tax burdens - current and required for alternative enrollment

6. Impact of expansion on meeting institutional and state objectives

*See also Tables 5c and 5d.

TABLE 5o

INFORMATION RELEVANT TO DECISIONS ABOUT
FINANCING OF POSTSECONDARY EDUCATION PROGRAMS*

1. Fund flows

   a. Sources of funds ($ amounts - operating and capital)
   b. Recipients of funds (institutions, students, etc.)
   c. Mechanisms (formulas) for disbursement

2. Beneficiaries of programs and type and amount of benefits (See Wallhaus and Micek, 1971)

   a. Students (higher education earnings, different life-style options, immediate consumption values, etc.)
   b. Faculty (salary payments, prestige, and position in society, etc.)
   c. Community (different cultural environment, business stimulus, etc.)
   d. Society (higher living standards, awareness of problems, and ability to solve them, etc.)

3. Expected costs of future programs - needs for funds

   a. $ amounts required for different purposes
   b. Future commitments of funds implied by approval of specific projects or programs

4. Programs competing for funds

   a. Objectives served by them
   b. $ amounts requested
   c. Current fund sources

5. Expected sources of funds

   a. Objectives of fund sources
   b. $ amounts involved
   c. Competing programs and institutions

6. Program priorities

   a. Programs that would be cut back if financing were not available

      (1) Institutional list
      (2) State list

   b. Effectiveness and efficiency of programs in meeting objectives

7. Incentives created by flow of funds and disbursement mechanisms

*See also Table 5h.

TABLE 5p

INFORMATION RELEVANT TO THE PROBLEM OF ESTABLISHING POLICIES ON TUITION, SCHOLARSHIPS, AND LOANS*

1. Identification of goals of aid programs

   a. Ultimate objectives

      (1) Redistribution of wealth
      (2) Equal opportunity

   b. Immediate objectives - more nearly equal access to postsecondary education (see Table 5c)

2. Student need

   a. Estimates of numbers of qualified students not attending college because of financial need by socioeconomic class, etc.
   b. Estimates of dollars required to attend (tuition, transportation, room, and board, etc.)
   c. Assessments of most effective mechanisms for providing aid

      (1) Form of aid (loan, scholarship, tax relief, tuition refund, etc.)
      (2) Disbursement procedures
      (3) Incentives created
      (4) Impact on decision-making roles
      (5) Differential tuition, graduated tuition

   d. Foregone income, need for basic living support
   e. Family hardships

3. Availability of funds for aid (state, federal, endowments, foundations, etc.)

4. Student attitudes toward indebtedness and "charity"

   a. Impact of tuition on enrollments, choice of school, etc.
   b. Barriers to borrowing by specific groups of people
   c. Barriers to accepting or applying for scholarships

5. Current expenditures for student aid

   a. Scholarships
   b. Loans
   c. Fee remissions

*See also Table 5d.

TABLE 5q

INFORMATION RELEVANT TO THE CERTIFICATION OF STUDENT COMPETENCE

1. Means of establishing achievement standards

   a. Standardized tests

      (1) Written or oral
      (2) Actual performance on the job

   b. Subjective evaluations by faculty, employers, etc.

   c. Implied certification based on actual employment, responsibility, receipt of degree, etc.

2. Evaluation of existing standards

   a. Comparisons of certified and uncertified students

      (1) Skill levels
      (2) General attitudes and maturity
      (3) Salaries
      (4) Type of employment

   b. Satisfaction of employers, faculty, etc.

3. Availability of adequate certification instrument

Although it seems unlikely that the general issues and relevant information included in Tables 4 and 5a to 5q will change drastically over the next decade or so, this certainly does not mean that operational information systems will remain adequate over this period. On the contrary, if the innovations in education systems, financing plans, etc., that are currently being discussed are adopted, information systems will have to be modified and extended substantially to meet the needs of both planners and administrators. And if they are not modified, difficulties are almost certain to result.

This raises several important questions. Who should assume responsibility for this future orientation? How much emphasis should it receive? How can future changes and innovations be anticipated in the design of operational information systems? None of these questions can be answered definitively, but brief comments do seem in order.

The question of who should have responsibility for anticipating future changes in postsecondary education is clearly a local matter that must be resolved by concerned individuals and organizations. It is also clear that state agencies should give this question more attention. The potential implications of some of the innovations now being discussed are simply too great to be ignored or overlooked.

The emphasis that future problems ought to receive is less certain. This depends in large part on expectations for the future. If few innovations and changes are anticipated, then little attention is warranted. However, if current expectations are a guide, it may be quite appropriate for state agencies to devote a substantial portion of their efforts on future programs and systems.

As for anticipating future changes and innovations in the design of information systems, likely changes and innovations must first be identified, and then these new systems, programs, procedures, and structures must be analyzed to determine as explicitly as possible the types of information and the specific data elements that must be included in a state's information system to administer them effectively.

It is instructive to illustrate with examples of how one might proceed. Tables 6a to 6c list the types of information that are relevant to the administration and operation of three different innovations that may be adopted in some or all states in the next few years. In some cases the generic types of information required to administer a new program may appear to be the same as required by one or more existing programs. However, as the definition of the proposed program is developed and refined and the program moves toward operational status, specific data requirements for administration and evaluation should become more evident. New accounting and data collection systems may be required for some programs (e.g., for facilities utilization for a university without walls), whereas "simple" reorientation of priorities or decision structures may suffice for others.

TABLE 6a

INFORMATION RELEVANT TO THE EVALUATION AND MANAGEMENT OF AN EXTERNAL DEGREE PROGRAM*

1. Purposes of program

   a. General needs not currently being met
   b. Special target groups

2. Relation to regular programs

   a. Comparability of degree recipients

      (1) Specific skill levels
      (2) General attitudes and maturity

   b. Comparability of opportunities provided

      (1) Salary levels
      (2) Type of employment entered

   c. Comparability of program duration

3. Impact on costs

   a. To institution and state - per student and per degree
   b. To student

      (1) Opportunity cost
      (2) Salary differentials

4. Availability of adequate test instruments and standards for awarding degrees

*See also Tables 5q, 5d, 5b, and 5a.

TABLE 6b

INFORMATION RELEVANT TO THE EVALUATION AND MANAGEMENT OF
A STUDENT VOUCHER SYSTEM FOR FINANCING POSTSECONDARY EDUCATION*

1. Purposes of system

   a. General needs not now being met
   b. Special target groups

2. Impact on student applications and enrollments

   a. Participation patterns in postsecondary education

      (1) 18-24 year olds
      (2) Individuals out of school for some time

   b. Demand for different programs and institutions

3. Impact on cost patterns

   a. Amounts paid by different groups (students, other taxpayers, etc.)
   b. Distribution of total burden

      (1) By socioeconomic categories
      (2) By age categories

   c. Percentage of national or state product spent on postsecondary education

4. Impact on institutions and programs

   a. Program and course offerings
   b. Relevance to society, students, faculty, etc.
   c. Fiscal stability and financial planning

*See also Tables 5d, 5o, 5p, 5b, and 5a.

TABLE 6c

INFORMATION RELEVANT TO THE EVALUATION AND MANAGEMENT OF A "UNIVERSITY WITHOUT WALLS"*

1. Purposes of program
    a. General needs not now being met
    b. Special target groups
2. Resources required to run the program
    a. Operating expenses
    b. Facilities and equipment
        (1) Owned or assigned to UWW
        (2) Space at other educational institutions
        (3) Space at noneducational institutions in community
    c. Faculty
3. Comparisons with established institutions
    a. Costs per credit hour, per degree, etc.
    b. Acceptance of graduates by employers
        (1) Type of jobs
        (2) Salaries
    c. Student interests, activities
    d. Types of programs offered
    e. Individuals attracted as students, faculty, etc.
        (1) Socioeconomic backgrounds
        (2) Program interests
    f. Duration of programs
4. Administrative systems required
    a. Special management problems

*See also Tables 5q, 5e, 5d, 5m, 5o, 5b, and 5a.

Hopefully, discussions with state-level planners and decision makers can provide additional insights into the availability of specific data, the costs of collecting them, and the specifics of their use in the planning and decision-making processes, both for current operational problems and for innovative future-oriented problems. It may also be possible to obtain some insights into the process of selecting the "optimal" set of information elements for the analysis of particular problems and issues.

SUMMARY AND CONCLUSIONS

This paper is intended primarily as a catalyst for the discussion of the many problems and issues that surround statewide planning for postsecondary education. It should be viewed not as a final statement of purpose or direction, but as the first of a series of stages in the process of defining, discussing, and analyzing the problems facing state-level policy and decision makers.

The discussion builds on fundamental notions of objectives and decisions. Essentially, it is argued that the complexity of postsecondary education forces the establishment of hierarchies of objectives, and that these hierarchies correspond roughly to similar hierarchies in organizational structures. Despite the variety of organizational arrangements in different states, this point of departure seems to provide a rational basis for limiting the scope of the investigation to only those issues and problems that are important state-level concerns.

Once the major issues facing statewide planners have been identified, attention can be shifted to the more practical task of identifying the types of information that are relevant to their resolution. The resulting lists of relevant information (one for each major issue or problem area) provide a firm foundation for the future development of communication aids in postsecondary education. They also suggest the kinds of analytical projects that would be relevant to the needs of state-level planners and decision makers.

It is important to note that this conceptualization, and even specific projects that may arise out of it, do not provide all the answers. They can provide important inputs into decision-making processes, and they may have significant impact on specific decisions by altering perceptions and values, but the decision maker must still apply his own values and priorities to the facts and figures in order to formulate his solutions to the problems at hand.

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